

Personality Preferences and Their Relationship to Ego Development in Australian Leadership Program Participants

Niki Vincent · Lynn Ward · Linley Denson

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Abstract The growth of adult ego development to post-conventional levels is associated with many adaptive advantages for the individual and society. However, the vast majority of adults across a wide range of samples demonstrate ego stages well below the maximum potential. In an effort to advance understanding of why and how development to higher ego levels might occur for some individuals and not others, we explored whether particular personality preferences and combinations thereof (as measured by the Myers-Briggs Type Indicator or MBTI) are associated with higher ego levels and whether particular personality preferences might act as inhibiting or facilitating factors in ego development. Participants were 374 adults (aged 18–61; 50 % female) undertaking 11 community leadership development and 2 professional management development programs. After adjusting for effects of age and education, a preference for Intuition on the MBTI was associated with significantly higher ego development on program entry and with greater ego development during the programs. These results are consistent with previous research and provide support for Manners' and Durkin's (Developmental Review, 20:475–513, 2000) proposal that dispositional personality characteristics may enhance or constrain ego development.

Keywords Myers-Briggs Type Indicator (MBTI) · Washington University Sentence Completion Test (WUSCT) · Leadership development level · Community leadership

Introduction

Described as one of the most comprehensive constructs in the field of developmental psychology (Westenberg and Block 1993), Loevinger's stage theory of ego development (Loevinger 1976) provides a framework for conceptualizing the growth in an individual's way of constructing meaning through the lifespan. Loevinger proposed an invariant sequence of stages, each characterized by qualitatively distinct conscious preoccupations, expressions of impulse control and interpersonal and cognitive styles (Manners and Durkin 2001). Each stage shift transforms perceptions of reality, offering a more integrated perspective (Cook-Greuter 1999). Development proceeds toward greater self and interpersonal awareness, decreasing defensiveness and increasing flexibility, reflection, skill in interacting with the environment, tolerance for difference and ambiguity, cognitive complexity, responsibility and personal autonomy (Cook-Greuter 2004). Table 1 displays a synopsis of each of these stages. Critical reviews of Loevinger's theory and its measurement tool, the Washington University Sentence Completion Test (WUSCT), have concluded that there is substantial empirical support for the construct and discriminant validity of both the theory and the WUSCT (Cohn and Westenberg 2004; Hauser 1976; Loevinger 1979; Manners and Durkin 2001).

According to a meta-analysis by Cohn (1998) of 92 studies involving over 12,000 participants from a wide range of samples, as well as more recent research by Cook-Greuter (2004), the vast majority (80–85 %) of adults stabilize at or below the Self-Aware ego stage. This is well below the maximum potential for development identified by Loevinger's theory, but it is consistent with findings of stabilization below the maximum potential found in other areas of adult development, such as cognitive and moral

N. Vincent (✉) · L. Ward · L. Denson
Faculty of Health Sciences, School of Psychology, University of
Adelaide, Adelaide, SA 5005, Australia
e-mail: niki.vincent@lisa.com.au

Table 1 Loevinger's stages of ego development

Tier	Stage	Typical manifestations
Pre-conventional	Impulsive	Demanding; impulsive; conceptually confused; concerned with bodily feelings, especially sexual and aggressive; no sense of psychological causation; dependent; good and bad seen in terms of how it affects the self; dichotomous good/bad, nice/mean.
	Self-protective	Wary; complaining; exploitive; hedonistic; preoccupied with staying out of trouble, not getting caught; learning about rules and self-control; externalizing blame.
Conventional	Conformist	Conventional; moralistic; sentimental; rule-bound; stereotyped; need for belonging; superficial niceness; behavior of others seen in terms of externals; feelings only understood at banal level; conceptually simple, 'black and white' thinking.
	Self-aware	Increased, although still limited, self-awareness and appreciation of multiple possibilities in situations; self-critical; emerging rudimentary awareness of inner feelings of self and others; banal level reflections on life issues: God, death, relationships, health.
	Conscientious	Self-evaluated standards; reflective; responsible; empathetic; long-term goals and ideals; true conceptual complexity displayed and perceived; can see the broader perspective and can discern patterns; principled morality; rich and differentiated inner life; mutuality in relationships; self-critical; values achievement.
Post-conventional	Individualistic	Heightened sense of individuality; concern about emotional dependence; tolerant of self and others; incipient awareness of inner conflicts and personal paradoxes, without a sense of resolution or integration; values relationships over achievement; vivid and unique way of expressing self.
	Autonomous	Capacity to face and cope with inner conflicts; high tolerance for ambiguity and can see conflict as an expression of the multifaceted nature of people and life in general; respectful of the autonomy of the self and others; relationships seen as interdependent rather than as dependent/independent; concerned with self-actualization; recognizes the systemic nature of relationships; cherishes individuality and uniqueness; vivid expression of feelings.
	Integrated	Wise; broadly empathic; full sense of identity; able to reconcile inner conflicts, and integrate paradoxes. Similar to Maslow's description of the 'self-actualised' person who is growth motivated, seeking to actualize potential capacities, to understand his/her intrinsic nature, and to achieve integration and synergy within the self (Maslow, 1962).

Manners and Durkin (2001).
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development (Manners and Durkin 2000). However, much research has demonstrated that growth to higher ego levels does occur in some individuals and is associated with adaptive advantages in relationships (Zilbermann 1984), parenting (Dayton 1981), preventive healthcare (Gast 1984; Michaelson 1985), organizational development (Bushe and Gibbs 1990; Guerette 1986; Marrewijk and Were 2003), management and leadership performance (Barker and Torbert 2011; Joiner and Josephs 2007; King

and Roberts 1992; McCauley et al. 2006; Merron 1985; Merron et al. 1987; Rooke and Torbert 1998; Strang and Kuhnert 2009; Torbert et al. 2004), career success (Vaillant and McCullough 1987), protection against burnout (Lambie 2007), adjustment to life changes (Bursik 1991) and the development of complex sustainability change initiatives (Brown 2011).

Recently, Barker and Torbert (2011), Cook-Greuter (2004), Joiner and Josephs (2007) and Rooke and Torbert

(2005) have all argued that adults who operate from post-conventional developmental levels are in an optimal position to make an important leadership contribution to the world because of their transformational capacity, agility, creativity, flexibility and mature insight. Donovan (1997) noted that a critical mass of such shifts in consciousness is essential for humanity to address the adaptive challenges of our times.

However, the processes involved in ego development and the reasons some people reach post-conventional levels, when the vast majority do not, remain unclear. Although the lack of a coherent theoretical account of such processes was one of the criticisms of Loevinger's theory (Broughton and Zahaykevich 1998), recently researchers have begun to focus on the factors that might facilitate progress to advanced stages (Manners and Durkin 2000; Manners et al. 2004; Marko (2011); Pfaffenberger 2005). To this end, Manners and Durkin (2000) developed a conceptual framework based on Loevinger's theoretical reflections and associated research—including studies of intervention programs that have been designed to promote ego development in adults, as well as theory and research into moral stage development and the processes involved in adult personality development. Their framework represents ego-stage transition as an accommodative restructuring of schemas in response to self-initiated or externally prompted life experiences that are emotionally engaging and challenging (but amenable to positive interpretation), personally salient, interpersonal in nature and that challenge the person's existing ways of seeing the world. Factors that might facilitate progress to advanced development appear to include the degree of exposure to such life experiences along with dispositional personality traits that interact in complex ways with life events to influence the likelihood of such exposure, whether such events are perceived as disequilibrating in relation to existing ego structures and, if so, whether this is resolved by assimilation (i.e., incorporating the new information into one's existing schemas) or accommodation (i.e., the construction of new schemas). For example, they argue that personality characteristics such as openness to new experiences, self-acceptance and the desire for challenge may influence the types of life experiences a person is exposed to (proactive interaction) and factors such as sense of self-efficacy and personal mastery, locus of control and openness to experience may impact the way in which such experiences are perceived and responded to (reactive interaction).

Loevinger and others who take a developmental approach to personality, viewing it as evolving over time in response to the environment, have often been locked in intellectual battles with those who conceptualize personality differences as innate dispositions that are stable across time. However, Kurtz and Tiegreen (2005) and Wilber

(2000) have argued that although these two traditions are often viewed as incompatible approaches to understanding human individuality, this need not be the case. It makes sense that differences between people at the same stage of ego development might be explained by differing dispositional personality factors (among other things) and vice versa. As Manners and Durkin (2000) have noted, it also makes sense that dispositional personality characteristics may enhance or constrain ego development.

One of the most popular inventories used to measure personality constructs outside the realm of academic psychology is the Myers-Briggs Type Indicator—or MBTI (Bayne 2003; Capraro and Capraro 2002; Rushton et al. 2007). It has proved to be a very useful tool in counseling, education and business for describing personality in lay terms and helping people to understand the nature and value of individual differences (Pittenger, 2005).

The MBTI differs from most other trait-based personality instruments; in that, the eight characteristics it defines do not vary in quantity. Rather, they are four pairs of dichotomous constructs that were specified or implied in Jung's theory of personality and describe opposite, but equally valid, ways in which we use our minds (Myers et al. 2003). The first dichotomy indicates differences in the way people orient their energy—either directing it primarily to the external world of people and things (Extraversion—E) or primarily to their inner world thoughts and reflections (Introversion—I). The second indicates differences in the way people take in information and the kind of information they like and trust, with some preferring to take in information using their senses and focus on the present and what is real and tangible (Sensing—S) and others preferring to go beyond what is real or concrete and focus on the future—patterns, possibilities, meanings and connections (Intuition—N). The third dichotomy indicates differences in the way people make decisions, with those with a preference for Thinking (T) preferring to base decisions on impersonal, objective logic and those with a preference for Feeling (F) preferring a person-centered, values-based process. The fourth indicates differences in orientation to the external world, with some having a preference for planning and organizing (Judging—J) and others preferring spontaneity and flexibility (Perceiving—P). These sets of opposite preferences result in 16 possible 'type' combinations. Each type (e.g., ENTJ or ISFP) will typically show characteristics resulting from the dynamic interplay of preferences from which it is comprised, such that each type is greater than the sum of its parts (Myers et al. 2003). There is a large—and growing—body of research that describes the temperaments, relationship choices and satisfaction, educational and career choices and performance, leadership and management performance, physical and mental health, as well as stress and

coping characteristics that are associated with the various preferences and their dynamic combinations.

In spite of the popularity of the MBTI, only a single study could be found in which it had been used to explore the relationship between personality and ego development. This was undertaken by Bushe and Gibbs (1990), and it found a modest but significant (.28) positive correlation between ego development and the MBTI preference for Intuition (N), and a modest but significant (−.26) negative correlation between the preference for Sensing (S) and ego development. No relationships between ego development and any of the other MBTI preferences were found—however, the sample size was small ($N = 64$).

This finding of a positive relationship between ego development and MBTI Intuition (N) makes sense, given that N has been found to be highly correlated with Openness on the NEO-PI (Furnham 1996; Furnham et al. 2003; MacDonald et al. 1994; McCrae and Costa 1989) which, in turn, has been found to be correlated with ego level (Einstein and Lanning 1998; Hogansen and Lanning 2001; Kurtz and Tiegreen 2005; Morros et al. 1998; Wright and Reise 1997). It also accords with Manners and Durkin's (2000) conceptual framework for ego-stage transition; in that, N types have been found to have higher levels of autonomy, personal growth and positive relations compared to Sensing (S) types (Harrington and Loffredo 2001) and to be open to the positive potential in people and situations and invest themselves enthusiastically in that potential (Bushe and Gibbs 1990; Cranton 2006). These qualities may positively influence both the types of potentially ego development triggering life experiences a person is exposed to, and the ways in which such experiences are perceived and responded to. In contrast, people with a preference for Sensing (S) have been found to lack tolerance for ambiguity (Steckroth et al. 1980) and to rely on routine (Cranton 2006). Such factors might both mitigate against self-initiated exposure to novel life experiences and predispose to resolving the disequilibrium created by such exposure by assimilation (and thus schema—and ego stage—stability). Sensing types, Cranton (2006) argued, might require immersion into an entirely new situation—such as a big change in environment or culture—in order to their shift habits of mind.

Other research on the dichotomous preferences suggests that a preference for Perceiving (P) as opposed to Judging (J) might have advantages for ego development. Associations between P and flexibility, imagination, adaptability, curiosity and openness to new ideas—all characteristics that are found to be more prevalent in higher stages of ego development—have been found (Myers et al. 2003). Perceiving has also been found to correlate with NEO-PI Openness (Furnham 1996; MacDonald et al. 1994; McCrae and Costa 1989)—a factor that is correlated with ego development as noted above.

A correlation has also been found between the MBTI Feeling (F) preference and Agreeableness on the NEO-PI (Furnham 1996; MacDonald et al. 1994; McCrae and Costa 1989) which, in turn, has been found to correlate with ego development (Einstein and Lanning 1998; Hogansen and Lanning 2001; Kurtz and Tiegreen 2005). Those with a preference for Feeling tend to make decisions by weighing personal and group values and feelings. They are concerned with the human, as opposed to the technical aspects of problems, as well as having a desire for warmth and harmony. Because they aim to maintain positive relationships, they tend to be responsive to the opinions and questions of others, trying to understand how they feel and entering into their frame of mind with empathy in order to see their perspective (Cranton 2006). Those with a preference for Thinking (T) on the other hand tend to rely on the principles of cause and effect and to be objective and impersonal in making decisions (Myers et al. 2003).

Research into the groupings of the MBTI preferences has also revealed particular combinations that might be more or less likely to be associated with higher ego development. Research with ST types has found, for example, that they showed most risk avoidance when in operating in challenging environments—a factor that might lead to less learning from such environments, and possibly less likelihood of experiencing them—whereas SF, NF and NT types were more risk tolerant (Walck 1996). NP types have been described as unconventional, independent spirits who seek out new challenges, new ideas and new people with a focus on exploring and experiencing the world and all of its potential (Myers et al. 2003). NP and NF types have also been found to be associated with higher creativity on various measures (Myers et al. 2003). These characteristics seem likely to enhance self-initiated exposure to, and learning from, novel life experiences (Myers et al. 2003). On the other hand, research with STJ's has found them to be resistant to change (Isachsen and Berens 1988; Clancy 1997). Because stability is very important to them, those with STJ preferences tend to focus on the status quo, seek order, dislike ambiguity and solve problems by relying on past experiences (Clancy 1997). These factors seem likely to mitigate against seeking out novel life experiences and might also lead to the resolution of disequilibrium created by such experiences by assimilation (i.e., incorporating the new information into one's existing schemas—thus stability of the schemas). It is for this reason that Lang (1997) argued that leaders with NFP preferences might be required to cope with the rapid pace of change in organizations.

In spite of the limited research looking at the MBTI and ego development, the findings outlined above do provide data from which inferences can be made about how, within Manners and Durkin's (2000) conceptual framework,

MBTI preferences and combinations of preferences might influence the types of life experiences a person is exposed to and/or the way in which such experiences are perceived and responded to—and thus impact ego development.

In an effort to advance understanding of why and how development to higher ego levels might occur for some individuals and not others, we set out to explore whether particular personality preferences (as measured by the MBTI) were associated with higher levels of development and whether particular personality preferences might act as inhibiting or facilitating factors in ego development for participants involved in leadership development programs that have the potential to trigger such growth. This research is part of a larger study that has investigated the efficacy of community leadership programs (CLPs) in triggering ego development (Vincent et al. 2013). Although CLPs have not been deliberately designed in terms of the framework for ego development developed by Manners and Durkin (2000), many fit this framework quite well; in that, they offer disequilibrating experiences that are interpersonal in nature, cognitively and emotionally engaging and challenging—as well as personally salient for the participants. CLPs recruit participants from very diverse business, government and not-for-profit leadership positions, who apply voluntarily and who have demonstrated the potential to become future leaders within their broader communities. All such programs facilitate experiential exposure to major economic, environmental, social and cultural issues affecting communities, countries and the globe and to the leaders at the forefront of these issues from a diversity of perspectives, sectors and industries. This often includes sessions such as working with the homeless, field trips to prisons, farms, indigenous communities and law courts, attending artistic performances and visiting businesses—as well as meetings with high-level state officials, and visiting overseas dignitaries. Some programs also include very challenging outward-bound experiences and overseas field trips to developing countries, individual coaching and personal development components, team building and community action learning projects. Program sessions are conducted under the Chatham House Rule to facilitate deeper disclosure. Although there are some differences in the structure and approach taken between CLPs, they generally describe themselves as taking participants out of their comfort zone, exposing them to aspects of society they would otherwise never experience and exploring and challenging values and beliefs. The types of experiences and activities that CLPs offer have the potential to be most disequilibrating for those at the last conventional stage of consciousness (Conscientious) because they begin to expose participants to the fundamental paradoxes in human nature, confront them with ambiguous challenges and invite them to face their discomfort with this, as well as

focus them on their own mental habits and biases—all concerns that Cook-Greuter (1999) noted come to the fore in the post-conventional stages. Most of the programs are run over a 10-month period from February to November each year.

This research aimed to utilize measures that were already in use in many of the programs and/or were non-threatening and quick and easy to explain and use.

Although this study should be regarded as exploratory, given that only one other study has considered the relationship between MBTI preferences and ego development (and then only indirectly), the following specific hypotheses were developed from the information and research about the characteristics of people with particular MBTI preferences (and groupings of preferences) outlined above. We also explored and/or controlled for effects of age, education and gender.

Specific hypotheses

1. Those with a preference for Intuition will score higher on ego development than those with a preference for Sensing at program entry (H1a) and will show greater change in ego development post-intervention (H1b).
2. Those with a preference for Feeling will score higher on ego development than those with a preference for Thinking at program entry (H2a) and will show greater change in ego development post-intervention (H2b).
3. Those with a preference for Perceiving will score higher on ego development than those with a preference for Judging at program entry (H3a) and will show greater change in ego development post-intervention (H3b).
4. NFP types will score higher on ego development than STJ types at program entry (H4a) and will show greater change in ego development post-intervention (H4b).

Although there were no hypothesized relationships between Extraversion–Introversion and ego development, given the lack of research utilizing the MBTI in this area, analyses including E–I were undertaken for exploratory purposes, as were analyses of MBTI whole types.

Materials and Methods

Participants

A total of 374 participants were recruited for this study—337 from 11 CLPs around Australia and 37 from two non-academic (but university-run) professional management programs (the latter serving as controls for another part of this research). Sample size was restricted by the number of programs prepared to participate in the research and the

number of people within the latter who agreed to participate. Overall, 96 % of participants in the 13 programs ($N = 390$) were tested at the commencement of their programs. Ninety percent of these ($n = 335$) participated in the final testing session at the end of their program.

Sixty-one percent of participants came from programs located in the metropolitan regions of major cities, and the remainder from programs in regional Australia. Fifty percent were female. Age ranged from 18 to 61 with a mean age of 40 ($SD = 7.78$). All spoke fluent English, but for 6 %, this was not their first language. Four percent of the sample was identified as Australian Aboriginal or Torres Strait Islander. As most participants recruited for the study were in positions of leadership, it is not surprising that the sample was highly educated, with 75 % having completed a university degree, 26 % having postgraduate qualifications at Masters or PhD level and only 6 % not having completed high school. The average education level attained was a university undergraduate degree.

Measures

The Washington University Sentence Completion Test (WUSCT)

The WUSCT has been described as the most extensively validated projective technique for assessing personality (Lilienfeld et al. 2000, p. 56). It was first published in 1970 (Loevinger and Wessler 1970; Loevinger et al. 1970) and revised in 1985 (Loevinger 1985) and in 1996 (Hy and Loevinger 1996). It has been used in hundreds of studies and administered to many thousands of people (Cohn and Westenberg 2004). The premise of the test is that meaning is created and communicated through language and a person's choice of sentence content and structure models the way they see the world (Cook-Greuter 1999). Respondents complete a series of 36 sentence stems selected for eliciting various aspects of ego development. Responses are scored using a detailed scoring manual (Hy and Loevinger 1996) and combined using ogive rules to place the respondent in one of the eight stages of ego development. We utilized the ogive rules modified by Cook-Greuter (1999); they have higher cut-off numbers for assigning high-end ego scores (E7 and above). Test forms for men and women are identical apart from a change in personal pronoun to make stems personally relevant. The test can be split in half to produce two abbreviated versions to prevent the measurement error effects found in repeated use of the full test (Redmore and Waldman 1975). The most recent version of the test is Form 81. It served as the basis for the revised scoring manual published by Hy and Loevinger (1996).

Research has provided substantial support for the reliability of the WUSCT (Loevinger 1979; Manners and

Durkin 2001). High inter-rater reliability has consistently been found in studies involving a range of populations. Using the item sum score, Loevinger and Wessler (1970) reported a Cronbach's alpha of .91, and this has been supported in several subsequent studies (Manners and Durkin 2001). High and significant correlations between the two split halves of the forms have been found, with a similar correlation between each half and the 36-item version (Novy and Francis 1992; Novy et al. 1997). Although the uniqueness of ego development theory and measurement have made it hard to find appropriate alternative measures with which to compare it for construct validity, those studies that have compared the WUSCT with other measures of personality development have found that it compared favorably (Manners and Durkin 2001).

Hy and Loevinger (1996) argued for the use of overall ego stage (a categorical measure) rather than item sum in research using the WUSCT. However, to allow the use of more powerful statistical techniques, both ego stage and item sum scores were analyzed in this study and will be reported as appropriate.

The Myers-Briggs Type Indicator (MBTI)

The MBTI Self-Scorable Form M is a self-report instrument where the respondent selects one of two options for each of 93 items to identify his or her preferences (and preference clarity scores) on the four dichotomies outlined earlier. A respondent is assigned one of 16 possible 'type' classifications based on their preferences.

A review of the psychometric properties of the MBTI and its reliability and validity was undertaken by Gardner and Martinko (1996) and found to be generally satisfactory. Capraro and Capraro's (2002) meta-analytic reliability study examined the variability of measurement error in multiple administrations of the MBTI. Although there was some variability, they reported strong internal consistency and test-retest reliability. Cronbach's Alpha was computed on more than 10,000 participants, and results ranged from .74 (TF) to .84 (SN). They also found test-retest coefficients to be stable over time (ranging from 1 week to 2.5 year intervals). Myers et al. (2003) reported more recent data on the psychometric properties of Form M. They found the split-half reliabilities of continuous scores for numerous samples generally exceeded .91 for each scale and test-retest reliability correlations range from .83 to .94 for a 4 week period. Test-retest reliabilities of continuous scores were calculated for different ranges of the preference clarity and correlations ranged from .99 to .93 for each scale with high preference clarity but were much lower (from .22 to .46) for the lowest preference clarity scores.

Extensive evidence of criterion-related validity is provided by type distribution tables which reveal differing proportions of types across occupations that are consistent with type theory. In addition, numerous studies have reported correlations between the scales of the MBTI and various personality, academic and interest matters (Gardner and Martinko 1996; Myers et al. 2003). Although at the present time the key structural assumptions of type theory and the way in which the MBTI is assumed to operationalize them remain in dispute, to be consistent with type theory, Myers et al. (2003) suggest using preference categories, combinations of preference categories and whole types as independent variables—which is how they were utilized in the current study.

Procedure

Participants gave informed consent to take part in the study. They completed the WUSCT (first 18 stems) and MBTI on program entry and the WUSCT (second 18 stems) on program exit (this was at 10 months for 9 of the programs, with one program finishing at 24 months, one at 16 months and two at 12 months). Due to funding limitations, all WUSCT protocols were scored by a single trained scorer. Scoring of 67 of the protocols was checked by another expert scorer who had graduated from the extensive sentence completion test-scoring certification course run by Cook-Greuter. The proportionate agreement on overall protocol ego level was 93 %, with a difference of one ego stage between scorers in only 7 % of the protocols ($\kappa = .79, p < .0005$).

Missing Data and Assumption Checks

Missing data for education level (2.9 %) and age (1.6 %) were treated with pairwise deletion in the analyses, resulting in different sample sizes for analyses with these variables included. Preliminary checks were conducted to ensure there were no violations of any of the assumptions of the statistical tests undertaken.

Table 2 Distribution of ego stage at program entry

Category	Frequency	%
E4: Conformist	7	1.9
E5: Self-aware	57	15.2
E6: Conscientious	252	67.4
E7: Individualistic	52	13.9
E8: Autonomous	6	1.6
Total	374	100.0

Results and Discussion

Distribution of Ego Levels and MBTI Preferences in the Sample

The item sum on the WUSCT (half protocol) for participants at program entry ranged from 78 to 126 ($M = 99.24$; $SD = 8.82$). Ego levels ranged from E4 (Conformist) to E8 (Autonomous). The frequencies of these ego level categories are reported in Table 2. The distribution of ego levels in the group was similar to that reported in recent research with adults in management (Cook-Greuter 2004). T-tests found no significant difference ($p < .05$) in the item sum scores for females ($M = 99.87$, $SD = 9.31$) and males ($M = 98.62$, $SD = 8.29$) or in the ogive-scored ego levels for females ($M = 6.03$, $SD = .70$) and males ($M = 5.94$, $SD = .61$).

The distribution of MBTI preferences and 16 whole MBTI types in the current sample is shown in Table 3. The preference distributions are very similar to recently published data for a large sample of employed Australians (Schaubhut and Thompson 2009). The type distributions are similar to those found among leaders in a US sample of almost 123,000 (Richmond 2008).

Preliminary Analyses—The Effects of Age and Education

The effect of age and education was investigated in preliminary analyses because research has found modest correlations between ego development and age and education in adult samples (Cohn 1998; Manners and Durkin 2001) as well as differences in educational achievement between the various MBTI dichotomous preferences (particularly S–N—with N being associated with higher educational achievement) and whole MBTI types (Furnham et al. 2003; Myers et al. 2003). Education level was coded as an ordinal scale. A small positive correlation between age and ego development (as measured by WUSCT item sum) was found, $r = .25$, $n = 368$, $p < .0005$, and a small positive correlation between education and ego development was also found, $r = .24$, $n = 363$, $p < .0005$. There was no significant difference in education level between those with a preference for Extraversion or Introversion. However, education level was significantly higher (although the effect sizes—eta-squared—were small) in participants with preferences for Intuition compared with Sensing [$t(361) = -3.57$, $p = .0005$ (two-tailed), eta-squared = .03], Thinking compared with Feeling [$t(361) = 2.65$, $p = .008$ (two-tailed), eta-squared = .02] and Judging compared with Perceiving [$t(361) = 2.42$, $p = .02$ (two-tailed), eta-squared = .02].

Table 3 Distribution of MBTI preferences and types and means and standard deviations for WUSCT item sum by preference/type on program entry and exit and education level

Preference/ Type	MBTI Frequencies – full sample				MBTI Frequencies – males				Education – full sample		WUSCT Item Sum – full sample				WUSCT Item Sum – females			
	females		males		Time 1 (%)		Time 2 (%)		Mean (SD) Time 1	Mean (SD) Time 2	Mean (SD) Time 1	Mean (SD) Time 2	Mean (SD) Time 1	Mean (SD) Time 2	Mean (SD) Time 1	Mean (SD) Time 2	Mean (SD) Time 1	Mean (SD) Time 2
	Time 1 (%)	Time 2 (%)	Time 1 (%)	Time 2 (%)	Time 1 (%)	Time 2 (%)	Time 1 (%)	Time 2 (%)										
Extraversion	216 (57.8)	198 (59.1)	119 (55.1)	109 (55)	97 (44.9)	89 (45)	6.25 (1.60)	6.25 (1.60)	98.80 (8.84)	102.49 (10.07)	99.91 (9.36)	103.97 (10.35)	98.08 (8.13)	100.67 (9.46)	99.91 (9.36)	103.97 (10.35)	98.08 (8.13)	100.67 (9.46)
Introversion	158 (42.2)	137 (40.9)	68 (43.0)	54 (39.4)	90 (57.0)	83 (60.6)	6.35 (1.55)	6.35 (1.55)	99.71 (8.73)	103.85 (10.45)	99.79 (9.27)	104.37 (9.81)	99.20 (8.46)	101.86 (10.80)	99.79 (9.27)	104.37 (9.81)	99.20 (8.46)	101.86 (10.80)
Sensing	185 (49.5)	160 (47.8)	88 (47.6)	73 (45.6)	97 (52.4)	87 (54.4)	6.00 (1.62)	6.00 (1.62)	96.56 (7.43)	99.42 (9.61)	96.67 (7.53)	100.47 (9.37)	96.62 (7.82)	99.43 (9.61)	96.67 (7.53)	100.47 (9.37)	96.62 (7.82)	99.43 (9.61)
Intuition	189 (50.5)	175 (52.2)	99 (52.4)	90 (51.4)	90 (47.6)	85 (48.6)	6.58 (1.49)	6.58 (1.49)	101.77 (9.27)	105.58 (9.89)	102.71 (9.83)	107.06 (9.84)	100.78 (8.28)	104.01 (9.76)	102.71 (9.83)	107.06 (9.84)	100.78 (8.28)	104.01 (9.76)
Thinking	225 (60.2)	205 (61.2)	100 (44.4)	89 (43.4)	125 (55.6)	116 (56.6)	6.47 (1.45)	6.47 (1.45)	99.02 (8.52)	102.27 (10.52)	99.99 (9.14)	103.42 (10.58)	98.51 (8.17)	101.39 (10.43)	99.99 (9.14)	103.42 (10.58)	98.51 (8.17)	101.39 (10.43)
Feeling	149 (39.8)	130 (38.8)	87 (58.4)	74 (56.9)	62 (41.6)	56 (43.1)	6.02 (1.73)	6.02 (1.73)	99.44 (9.22)	103.22 (9.73)	99.72 (9.54)	104.93 (9.60)	98.84 (8.59)	100.96 (9.51)	99.72 (9.54)	104.93 (9.60)	98.84 (8.59)	100.96 (9.51)
Judging	199 (53.2)	175 (52.2)	111 (55.8)	94 (53.7)	88 (44.2)	81 (46.3)	6.48 (1.49)	6.48 (1.49)	99.44 (8.11)	102.51 (9.95)	100.18 (8.95)	103.32 (10.03)	98.59 (7.05)	101.58 (9.83)	100.18 (8.95)	103.32 (10.03)	98.59 (7.05)	101.58 (9.83)
Perceiving	175 (46.8)	160 (47.8)	76 (43.4)	69 (43.1)	99 (56.6)	91 (56.9)	6.08 (1.66)	6.08 (1.66)	98.89 (9.55)	102.77 (10.53)	99.41 (9.85)	105.17 (10.28)	98.65 (9.28)	100.96 (10.41)	99.41 (9.85)	105.17 (10.28)	98.65 (9.28)	100.96 (10.41)
ENFJ	16 (4.3)	15 (4.5)	–	–	–	–	6.53 (1.41)	6.53 (1.41)	105.31 (7.14)	110.60 (10.74)	–	–	–	–	–	–	–	–
ENFP	39 (10.4)	34 (10.2)	–	–	–	–	6.00 (1.65)	6.00 (1.65)	100.74 (9.28)	105.38 (8.50)	–	–	–	–	–	–	–	–
ENTJ	25 (6.7)	24 (7.2)	–	–	–	–	7.00 (1.41)	7.00 (1.41)	103.04 (7.84)	104.13 (10.02)	–	–	–	–	–	–	–	–
ENTP	39 (10.4)	38 (11.3)	–	–	–	–	6.62 (1.30)	6.62 (1.30)	100.74 (9.54)	104.21 (10.63)	–	–	–	–	–	–	–	–
ESFJ	26 (7.0)	23 (6.9)	–	–	–	–	6.04 (1.66)	6.04 (1.66)	97.38 (7.40)	101.87 (8.65)	–	–	–	–	–	–	–	–
ESFP	13 (3.5)	13 (3.9)	–	–	–	–	4.62 (1.66)	4.62 (1.66)	94.08 (7.48)	94.08 (7.11)	–	–	–	–	–	–	–	–
ESTJ	41 (11.0)	35 (10.4)	–	–	–	–	6.08 (1.51)	6.08 (1.51)	96.39 (8.32)	99.54 (10.22)	–	–	–	–	–	–	–	–
ESTP	16 (4.3)	15 (4.5)	–	–	–	–	6.25 (1.57)	6.25 (1.57)	92.81 (6.08)	96.93 (7.69)	–	–	–	–	–	–	–	–
INFJ	10 (2.7)	8 (2.4)	–	–	–	–	6.70 (1.70)	6.70 (1.70)	102.00 (12.04)	104.62 (5.60)	–	–	–	–	–	–	–	–
INFP	16 (4.3)	14 (4.2)	–	–	–	–	5.43 (1.55)	5.43 (1.55)	99.37 (10.54)	101.00 (10.80)	–	–	–	–	–	–	–	–
INTJ	19 (5.1)	18 (5.4)	–	–	–	–	7.42 (90)	7.42 (90)	102.37 (8.86)	104.94 (9.56)	–	–	–	–	–	–	–	–
INTP	26 (7.0)	25 (7.5)	–	–	–	–	6.96 (1.31)	6.96 (1.31)	103.38 (9.79)	110.20 (9.37)	–	–	–	–	–	–	–	–
ISFJ	18 (4.8)	15 (4.5)	–	–	–	–	7.06 (1.11)	7.06 (1.11)	100.06 (5.17)	105.20 (8.60)	–	–	–	–	–	–	–	–
ISFP	10 (2.7)	7 (2.1)	–	–	–	–	5.11 (2.47)	5.11 (2.47)	91.90 (10.93)	96.14 (9.67)	–	–	–	–	–	–	–	–
ISTJ	45 (12.0)	38 (11.3)	–	–	–	–	6.07 (1.45)	6.07 (1.45)	97.53 (6.67)	99.24 (9.83)	–	–	–	–	–	–	–	–
ISTP	15 (4.0)	13 (3.9)	–	–	–	–	5.67 (1.45)	5.67 (1.45)	96.93 (5.32)	97.08 (9.99)	–	–	–	–	–	–	–	–
Total	374	335	–	–	–	–	6.29 (1.58)	6.29 (1.58)	99.24 (8.82)	102.64 (10.22)	–	–	–	–	–	–	–	–

Education coded as 4 = completed high school, 5 = vocational diploma, 6 = undergraduate university degree, 7 = university honors degree or graduate certificate, 8 = Masters degree, 9 = PhD/MD

Differences in education between the MBTI whole types at program entry were investigated using a one-way between-groups analysis of variance. There was a significant difference for the groups [$F(15, 347) = 4.22, p = .0005$] with a large effect size (eta-squared = .15). Post hoc comparisons using the Tukey HSD test indicated that the mean education level for those classified as INTJ was significantly higher than those classified as ISFP, ESFP and INFP. In addition, those classified as ESFP had significantly lower education than those classified as ISFJ, INTP, ENTP and ENTJ. There was no difference in education between STJ types (ESTJ and ISTJ) and NFP types (ENFP, INFP). The results for INTJ and ESFP are consistent with previous research which found that NT types are the highest achievers in education and SP types are the lowest (Myers et al. 2003; Woodruff and Clarke 1993). There is a mismatch between the learning style of SP types and traditional educational systems (Myers et al. 2003). Table 3 displays the means and standard deviations for education level for each MBTI dichotomous preference and each whole type at program entry.

The Relationship Between MBTI Preferences and Ego Development

To test the hypotheses relating to single dichotomous personality preferences and ego development at program entry, four 2-by-2 between-groups analysis of covariance were conducted to compare males and females and the E–I, S–N, T–F and J–P MBTI groups (independent variables) on

the WUSCT item sum at time 1 (dependent variable) after controlling for age and education (covariates). Table 3 shows the mean WUSCT item sum and standard deviation for each MBTI preference and by gender.

After adjusting for age and education, there were no significant interaction effects of MBTI preferences and gender in any of the analyses. There were also no significant main effects for gender, Extraversion vs Introversion, Thinking vs Feeling or Judging vs Perceiving on the MBTI—thus, Hypothesis 2a and 3a were not supported. There was a significant main effect for Sensing versus Intuition [$F(1, 353) = 20.98, p < .0005$, partial eta-squared = .06]. There was a small relationship between both age and education and the WUSCT item sum as indicated by partial eta-squared value of .05 for both.

In order to clarify the relationship between ego development level and the Sensing and Intuition preferences, males and females were combined and divided into three groups according to their stage of ego development on program entry (time 1). As there were very small numbers of participants in the stages earlier than ‘Self-Aware’ or later than ‘Individualistic’, the program stages were collapsed into three categories—‘Self-Aware or earlier’; ‘Conscientious’; ‘Individualistic or later’—and a chi-square test for independence was conducted. As expected, this indicated a significant association between the ego development category and a preference for Sensing or Intuition, $\chi^2(2, n = 374) = 30.26, p = .0005$, Cramers $V = .28$. Table 4 displays the counts and percentages of those with a preference for Sensing and those with a

Table 4 Results of chi-square analysis exploring the association between ego stage on program entry and the MBTI Sensing/Intuition preference

		MBTI Sensing	MBTI Intuition	Total
Ego stage on program entry				
Self-aware or earlier	Count	43	21	64
	Within ego category (%)	67.2	32.8	100.0
	Within S or N (%)	23.2	11.1	17.1
	Of Total (%)	11.5	5.6	17.1
Conscientious	Count	131	121	252
	Within ego category (%)	52.0	48.0	100.0
	Within S or N (%)	70.8	64.0	67.4
	Of total (%)	35.0	32.4	67.4
Individualistic or later	Count	11	47	58
	Within ego category (%)	19.0	81.0	100.0
	Within S or N (%)	5.9	24.9	15.5
	Of total (%)	2.9	12.6	15.5
Total				
	Count	185	189	374
	Within ego category (%)	49.5	50.5	100.0
	Within S or N (%)	100.0	100.0	100.0
	Of total (%)	49.5	50.5	100.0

preference for Intuition in each ego development category within the sample. It can be seen that 23.2 % of participants with a preference for Sensing were in the 'Self-Aware or earlier' category on program entry compared to only 11.1 % of those with a preference for Intuition. In contrast, only 5.9 % of those with a preference for Sensing were in the 'Individualistic or later' category of ego development compared to 24.9 % of those with a preference for Intuition.

At the end of the programs, 29 % of participants overall had shifted up one or more ego stages (this varied by individual program from 16 to 44 % and is the subject of a forthcoming paper). To test the hypotheses relating to single dichotomous personality preferences and ego development at program exit (H1b, 2b and 3b), four 2-by-2 between-groups analysis of covariance were conducted to compare males and females and the E-I, S-N, T-F and J-P MBTI groups (independent variables) on the WUSCT item

sum at time 2 (dependent variable) after controlling for WUSCT item sum at time 1, age and education (covariates). Table 3 shows the mean WUSCT item sum and standard deviation for each MBTI preference overall and by gender at the end of the program (time 2).

After adjusting for WUSCT item sum at time 1, age and education, there were no significant interaction effects of MBTI preferences and gender in any of the analyses. There were no significant main effects for Extraversion vs Introversion, Thinking vs Feeling or Judging vs Perceiving on the MBTI. There was a significant main effect for Sensing vs Intuition [$F(1, 315) = 6.76, p = .01$, partial eta-squared = .02]. There was also a significant main effect for gender [$F(1, 315) = 6.90, p = .009$, partial eta-squared = .02] with females being more likely to have increased on the WUSCT item sum. There was no significant relationship between the WUSCT item sum at time 2 and age, and only a very small relationship between

Table 5 Results of chi-square analysis exploring the association between ego-stage increase on program exit, the MBTI Sensing/Intuition preference and gender

		Ego-stage change category		
		No ego-stage increase	Ego-stage increase	Total
MBTI preference				
Sensing (S)	Count	122	38	160
	Within S or N (%)	76.3	23.8	100.0
	Within change category (%)	51.5	38.8	47.8
	Of total (%)	36.4	11.3	47.8
Intuition (N)	Count	115	60	175
	Within S or N (%)	65.7	34.3	100.0
	Within change category (%)	48.5	61.2	52.2
	Of total (%)	34.3	17.9	52.2
Total				
	Count	237	98	335
	Within S or N (%)	70.7	29.3	100.0
	Within change category (%)	100.0	100.0	100.0
	Of total (%)	70.7	29.3	100.0
Gender				
Female	Count	105	58	163
	Within gender (%)	64.4	35.6	100.0
	Within change category (%)	44.3	59.2	48.7
	Of total (%)	31.3	17.3	48.7
Male	Count	132	40	172
	Within gender (%)	76.7	23.3	100.0
	Within change category (%)	55.7	40.8	51.3
	Of total (%)	39.4	11.9	51.3
Total				
	Count	237	98	335
	Within gender (%)	70.7	29.3	100.0
	Within change category (%)	100.0	100.0	100.0
	Of total (%)	70.7	29.3	100.0

education (partial eta-squared value of .03) and WUSCT item sum at time 2.

However, because the WUSCT item sum is only an indicator of ego development and does not reflect whether or not a person has shifted an ego stage (it is possible for a person's WUSCT item sum to increase significantly without him/her actually changing ego stage, or for the item sum to stay the same when a stage change has occurred), a new variable was created, categorizing participants according to whether, at the end of the program, they had increased a stage or not. A series of chi-square tests for independence were carried out to explore associations between the MBTI variables and gender with the ego-stage change variable.

There were no significant associations between E or I, T or F and J or P and ego-stage change. However, there was a significant association with Sensing vs Intuition [χ^2 (1, $n = 335$) = 3.99, $p = .05$, $\phi = .12$] and for gender [χ^2 (1, $n = 335$) = 5.56, $p = .02$, $\phi = -.14$]. Table 5 displays the counts and percentages for the latter analyses. It shows that participants with a preference for Intuition were more likely to have increased an ego stage at the end of the program (34 % of those with a preference for Intuition compared with 24 % of those with a preference for Sensing). It also shows that female participants were more likely to have increased an ego stage at the end of the program (35.5 % of females as opposed to 26.3 % of males). Of those participants who increased an ego stage, 61.2 % had a preference for Intuition and 59.2 % were female.

The associations between a preference for Intuition on the MBTI and higher ego development on program entry and greater ego development during the program are consistent with previous research, as well as research that has found a correlation between the MBTI Intuition preference and Openness to Experience factor on the NEO-PI—the latter also being positively correlated with ego development. These findings accord with Manners and Durkin's (2000) conceptual framework for ego-stage transition in which they argue that personality characteristics such as openness to new experiences may influence the types of life experiences a person is exposed to (proactive interaction) and the way in which such experiences are perceived and responded to (reactive interaction).

Given the results of previous research cited in Sect. 1, it is somewhat surprising that no relationships between the preferences for Perceiving or Feeling and ego development were found in the current research. However, much of the previous research relating NEO-PI factors to ego development was undertaken with student samples in which a wider range of ego development stages were represented—including many of the early stages. Participants in the current study were, in general, mature adults in leadership

roles, with a much narrower range of ego stages represented—and these being restricted to the conventional and later stages. Apart from the statistical problems associated with a truncated range of ego stages, it may also be the case that personality preferences as measured by the MBTI have a weaker association with ego development in older adults—especially those who have achieved leadership roles. This is because the MBTI measures only the underlying personality preference, not the individual's development outside this preference. Myers et al. (2003) discuss the emergence of the non-preferred functions at midlife and beyond—whereby people appear to be naturally motivated to complete their personalities by developing their non-preferred functions (for example, the deliberate development of Feeling skills by a person with a preference for Thinking). Arguably, many of those who have reached positions of leadership and maturity (and perhaps especially those volunteering to participate in CLPs, as in the current sample) will have recognized the strengths and weaknesses of their innate personality preferences and worked to address the weaknesses by developing skills, and exposing themselves to experiences that are outside of their natural preferences. In doing so, they may have exposed themselves to the types of experiences that trigger ego development—thus making it harder to discern a relationship between natural personality preferences and ego development in such a sample.

Although beyond the scope of this paper, the finding of a female advantage in ego development during the course of the program is interesting and, as far as we know, has not been found before. Although a meta-analysis of gender differences in the course of personality development found a female advantage in school students, this declined substantially among college-age adults and disappeared entirely among older men and women (Cohn 1991). The lack of a gender difference in ego development on entry in the current study is consistent with this.

The Relationship Between NFP and STJ Types and Ego Development

In order to test the hypothesis that NFP types would score higher on ego development than STJ types at program entry (H4a), an independent samples t test was conducted to compare the WUSCT item sum scores at program entry for STJ types ($N = 86$) with NFP types ($N = 55$). There was a significant difference in scores for STJ types ($M = 96.99$, $SD = 7.48$) and NFP types ($M = 100.35$, $SD = 9.58$); t (95.06) = -2.20, $p = .03$ (two-tailed). However, the magnitude in the differences in the means (mean difference = -3.36, 95 % CI: -6.38 to -.33) was small (eta-squared = .03)—and smaller than for the comparison between Sensing and Intuition types, indicating

that the inclusion of TJ and FP preferences moderated the effect rather than strengthening it. This was borne out by the lack of support for the hypothesized association between STJ and NFP types and ego-stage change during the program (H4b)—whereas (as noted above) those with a preference for Intuition, when analyzed alone, were more likely to have increased an ego stage at the end of the program when compared to Sensing types.

The Relationship Between Ego Development and MBTI Whole Types

Table 3 displays the means and standard deviations on the WUSCT item sum for each of the MBTI whole types at program entry and exit. An exploratory one-way between-groups analysis of variance examined the impact of MBTI whole type on ego development, as measured by the WUSCT item sum. Males and females were combined because there were too few participants in some whole type groupings to analyze them separately. There was a statistically significant difference at the $p < .05$ level in WUSCT item sum scores for the 16 MBTI types: $F(15, 358) = 3.85, p < .0005$. The effect size, calculated using eta-squared, was .14 (large). Post hoc comparisons using the Tukey HSD indicated that the mean WUSCT item score for participants of ISFP type ($M = 91.90, SD = 10.93$) and ESTP type ($M = 92.81, SD = 6.08$) was significantly lower than that for participants of ENFJ type ($M = 105.31, SD = 7.14$), ENTJ type ($M = 103.04, SD = 7.84$) and INTP type ($M = 103.38, SD = 9.79$). In addition, the mean WUSCT item score for participants of ESTJ type ($M = 96.39, SD = 8.32$) and ESFP type ($M = 94.08, SD = 7.48$) was significantly lower than that for participants of an ENFJ type (see above). All of the latter comparisons were significant at $p < .03$. The preliminary analyses of educational level differences between MBTI whole types did not show any differences between any of the latter types. Again, it should be noted that all differences were between types with a preference for Sensing versus Intuition. However, not all whole types including a preference for Sensing were significantly lower on ego development and vice versa—so as mentioned above, perhaps some of the other preferences included in the whole type combinations act as moderators in particular combinations. Although there was no discernible pattern of possible moderating preferences in these whole types from which to draw any such conclusions, this is consistent with the finding of Myers et al. (2003) that “...there are characteristics of whole types that are not predictable from knowledge of the individual preferences alone or from simple additive models of the preferences” (p. 219).

A one-way between-groups analysis of variance was conducted to explore the impact of whole MBTI type on

the change in WUSCT item sum at program exit. This was not statistically significant. The analyses of whole types were weakened by the smaller numbers included in each category and should be repeated with much larger samples in future research.

Conclusions

As only one study utilizing a small sample has previously examined the relationship between personality preferences as measured by the MBTI and ego development (Bushe and Gibbs 1990), the current study set out to fill this void using a much larger sample and with the addition of a component that explored the relationship between MBTI preferences and change in ego development following an intervention.

The current research has reinforced the finding from one previous study that Intuition, as measured by the MBTI, is associated with higher ego development. In addition, it found something that has not been demonstrated before—that those with a preference for Intuition were more likely than Sensing types to have increased an ego stage at the end of a leadership development program. Although the effect sizes of these analyses were modest, the findings do have some practical relevance for those seeking to design programs that trigger ego development for Sensing types. Such programs need to provide a holding environment in which Sensing types can, perhaps over a longer time span than is required for Intuitive types, be exposed to experiences that are designed to help them develop tolerance for ambiguity and lack of routine, that expose them to new concepts on multiple levels, and that immerse them in entirely new situations and expose them to alternative perspectives and values in order to challenge them out of their comfort zones and shift their habits of mind (yet do not push them beyond the limits of their tolerance too rapidly).

When interpreting the results of the present study, several limitations warrant consideration. Firstly, the restriction of the measurement of personality to the MBTI—although deliberate in this case (to ensure that research participation was relatively simple and usefully aligned with the typical content of the leadership programs)—limits the strength of our conclusions. Although the sample size was large and relatively similar to other published managerial samples in terms of the spread of ego stages and MBTI preferences, the results are not necessarily generalizable to the adult population as a whole. For example, the lack of representation of ego levels below Self-Aware in the current sample means that it is not possible to draw any conclusions about whether the finding in relation to Intuition and ego development is

generalizable to those at earlier stages of development. Finally, although the sample size was large, it was not large enough to obtain sufficient samples of all of the 16 MBTI whole types. The results of these analyses should thus be treated as preliminary and repeated with larger samples.

Overall, our results provide some reassurance to those wishing to enhance their ego development and to those designing and facilitating programs that help them to do so. Intuitive types appear to have a slight advantage, but in general personality preferences, as measured by the MBTI, do not appear to be a large factor in influencing ego development—at least among mature aspiring community leaders. This invites the question as to why a significant number of participants — 29 % overall with a range of 16–44 % depending on the particular program (Vincent et al. 2013)—transitioned to a higher stage of ego development during the course of the intervention programs in this study, but the others did not. Future research should continue the search to identify the characteristics of people who are likely to mature, in ego development terms, during such interventions—and through adulthood in general (including further exploration of the finding of the female advantage in this study). It might also usefully explore whether those who experience such maturation actually become better leaders in their communities.

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References

- Barker, E. H., & Torbert, W. R. (2011). Generating and measuring practical differences in leadership performance at postconventional action-logics. In A. H. Pfaffenberger, P. W. Marko, & A. Combs (Eds.), *The postconventional personality: Assessing, researching, and theorizing* (pp. 39–56). New York: State University of New York Press.
- Bayne, R. (2003). Love, money and studying. *The Psychologist*, 16, 529–531. Retrieved from http://www.thepsychologist.org.uk/archive/archive_home.cfm/volumeID_16-editionID_99-ArticleID_611-getfile_getPDF/thepsychologist/oct03he.pdf.
- Broughton, J. M., & Zahaykevich, M. K. (1998). Ego and ideology: A critical review of Loevinger's theory. In D. K. Lapsley & F. Clarke Powers (Eds.), *Self, ego and identity: Integrative approaches* (pp. 45–70). New York: Springer-Verlag.
- Brown, B. (2011). An empirical study of sustainability leaders who hold post-conventional consciousness. *Integral Thinkers*. Retrieved from <http://integralthinkers.com/wp-content/uploads/Brown-2011-empirical-study-of-sustainability-leaders.pdf>.
- Bursik, K. (1991). Adaptation to divorce and ego development in adult women. *Journal of Personality and Social Psychology*, 60, 300–306. doi:10.1037/0022-3514.60.2.300.
- Bushe, G. R., & Gibbs, B. W. (1990). Predicting organisation development consulting competence from the Myers Briggs Type Indicator and stage of ego development. *The Journal of Applied Behavioural Science*, 26, 337–357. doi:10.1177/0021886390263008.
- Capraro, R. M., & Capraro, M. M. (2002). Myers-briggs type indicator score reliability across: Studies a meta-analytic reliability generalization study. *Educational and Psychological Measurement*, 62, 590–602. doi:10.1177/0013164402062004004.
- Clancy, S. G. (1997). STJs and change: Resistance, reaction, or misunderstanding? In C. Fitzgerald & L. Kirby (Eds.), *Developing leaders: Research and applications in psychological type and leadership development* (pp. 415–438). Palo Alto, CA: Davies-Black Publishing.
- Cohn, L. D. (1991). Sex differences in the course of personality development. *Psychological Bulletin*, 109(2), 252–266. doi:10.1037/0033-2909.109.2.252.
- Cohn, L.D. (1998). Age trends in personality development: A quantitative review. In: P.M. Westenberg, A. Blasi, & L.D. Cohn (Eds.), *Personality development: Theoretical, empirical and clinical investigations of Loevinger's conception of ego development* (pp. 133–143). Hillsdale, NJ: Erlbaum.
- Cohn, L. D., & Westenberg, P. M. (2004). Intelligence and maturity: Meta-analytic evidence for the incremental and discriminant validity of Loevinger's measure of ego development. *Journal of Personality and Social Psychology*, 86(5), 760–772. doi:10.1037/0022-3514.86.5.760.
- Cook-Greuter, S. (1999). *Postautonomous ego development: A study of its nature and measurement*. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (<http://search.proquest.com/docview/304503009?accountid=8203>).
- Cook-Greuter, S. R. (2004). Making the case for a developmental perspective. *Industrial and Commercial Training*, 36(7), 275–281. doi:10.1108/00197850410563902.
- Cranton, P. (2006). *Understanding and promoting transformative learning: A guide for educators of adults*. San Francisco, CA: Jossey-Bass.
- Dayton, L.S. (1981). *The relationship between ego development of mothers and their emotional, social and cognitive support of their children* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (<http://search.proquest.com/docview/303160809?accountid=8203>).
- Donovan, T. (1997). *The edge of the possible: Intelligence of a New Era*. New South Wales: Business and Professional Publishing.
- Einstein, D. & Lanning, K. (1998). Shame, guilt, ego development and the five-factor model of personality. *Journal of Personality*, 66, 555–582. Retrieved from <http://www.wiley.com.proxy.library.adelaide.edu.au/WileyCDA/>.
- Furnham, A. (1996). The big five versus the big four. *Personality and Individual Differences*, 21, 303–307. doi:10.1016/0191-8869(96)00033-5.
- Furnham, A., Moutafi, J., & Crump, J. (2003). The relationship between the revised NEO—personality inventory and the Myers-Briggs Type Indicator. *Social Behaviour and Personality*, 31, 577–584. doi:10.2224/sbp.2003.31.6.577.
- Gardner, W.L. & Martinko, M.J. (1996). Using the Myers-Briggs Type Indicator to study managers: A literature review and research agenda. *Journal of Management*, 22(1), 45–83. Retrieved from <http://www.sagepub.com.proxy.library.adelaide.edu.au/journal.aspx?pid=10604>.
- Gast, H.L. (1984). *The relationship between stages of ego development and developmental stages of health self care operations* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (<http://search.proquest.com/docview/303314612?accountid=8203>).
- Guerette, R.H. (1986). Environmental Integrity and Corporate Responsibility'. *Journal of Business Ethics*, 5, 409–415. Retrieved from <http://www.springerlink.com.proxy.library.adelaide.edu.au/home/main.mpx>.

- Harrington, R. & Loffredo, D.A. (2001). The relationship between life satisfaction, self-consciousness, and the Myers-Briggs Type Inventory dimensions. *The Journal of Psychology*, 135(4), 439–450. Retrieved from <http://www.taylorandfrancisgroup.com/>.
- Hauser, S. T. (1976). Loevinger's model and measure of ego development: A critical review. *Psychological Bulletin*, 83, 928–955. doi:10.1037/0033-2909.83.5.928.
- Hogansen, J., & Lanning, K. (2001). Five factors in sentence completion test categories: Toward rapprochement between trait and maturational approaches to personality. *Journal of Research in Personality*, 35, 449–462. doi:10.1006/jrpe.2001.2331.
- Hy, L. X., & Loevinger, J. (1996). *Measuring ego development* (2nd ed.). New Jersey: Lawrence Erlbaum Associates.
- Isachsen, O., & Berens, L. V. (1988). *Working together: A personality centered approach to management*. Coronado, CA: Newworld Management Press.
- Joiner, B., & Josephs, S. (2007). *Leadership agility: Five levels of mastery for anticipating and initiating change*. San Francisco: Jossey-Bass/Wiley.
- King, P.J. & Roberts, N.C. (1992). An investigation into the personality profile of policy entrepreneurs. *Public Productivity & Management Review*, XVI(2), 173–190. Retrieved from <http://www.jstor.org.proxy.library.adelaide.edu.au/stable/10.2307/3380990>.
- Kurtz, J. E., & Tiegreen, S. B. (2005). Matters of conscience and conscientiousness: The place of ego development in the five factor model. *Journal of Personality Assessment*, 85(3), 312–317. doi:10.1207/s15327752jpa8503_07.
- Lambie, G.W. (2007). The contribution of ego development level to burnout for school counsellors: Implications for professional school counselling. *Journal of Counselling and Development*, 85(1), 82–88. Retrieved from <http://www.counseling.org.proxy.library.adelaide.edu.au/publications>.
- Lang, R. (1997). Type flexibility in processes of strategic planning and change. In C. Fitzgerald & L. Kirby (Eds.), *Developing leaders: Research and applications in psychological type and leadership development* (pp. 487–512). Palo Alto, CA: Davies-Black Publishing.
- Lilienfeld, S. O., Wood, J. M., & Garb, H. N. (2000). The scientific status of projective techniques. *Psychological science in the public interest*, 1(2), 27. doi:10.1111/1529-1006.002.
- Loevinger, J. (1976). *Ego development*. San Francisco: Jossey-Bass.
- Loevinger, J. (1979). Construct validity of the sentence completion test of ego development. *Applied Psychological Measurement*, 3, 281–311. doi:10.1177/014662167900300301.
- Loevinger, J. (1985). A revision of the sentence completion test for ego development. *Journal of Personality and Social Psychology*, 48, 420–427. doi:10.1037/0022-3514.48.2.420.
- Loevinger, J., & Wessler, R. (1970). *Measuring ego development (vol 1)*. San Francisco: Jossey-Bass.
- Loevinger, J., Wessler, R., & Redmore, C. (1970). *Measuring ego development (vol 2)*. San Francisco: Jossey-Bass.
- MacDonald, D. A., Anderson, P. E., Tsagarakis, C. I., & Holland, C. J. (1994). Examination of the Myers-Briggs Type Indicator and the NEO personality inventory. *Psychological Reports*, 74, 339–344. doi:10.2466/pr0.1994.74.1.339.
- Manners, J., & Durkin, K. (2000). Processes involved in adult ego development: A conceptual framework. *Developmental Review*, 20, 475–513. doi:10.1006/drev.2000.0508.
- Manners, J., & Durkin, K. (2001). A critical review of the validity of ego development theory and its measurement. *Journal of Personality Assessment*, 77(3), 541–567. doi:10.1207/S1532752JPA7703_12.
- Manners, J., Durkin, K., & Nesdale, A. (2004). Promoting advanced ego development among adults. *Journal of Adult Development*, 11(1), 19–27. doi:10.1023/B:JADE.0000012524.32002.8d.
- Marko, P. W. (2011). Exploring facilitative agents that allow ego development to occur. In A. H. Pfaffenberger, P. W. Marko, & A. Combs (Eds.), *The postconventional personality: Assessing, researching, and theorizing* (pp. 87–100). New York: State University of New York Press.
- Marrewijk, M.V. & Were, M. (2003). Multiple levels of corporate sustainability. *Journal of Business Ethics*, 44(2/3), 107–119. Retrieved from <http://www.springerlink.com.proxy.library.adelaide.edu.au/home/main.mpx>.
- Maslow, A. H. (1962). *Toward a psychology of being*. New York: Van Nostrand.
- McCauley, C. D., Drath, W. H., Palus, C. J., O'Connor, P. M. G., & Baker, B. A. (2006). The use of constructive developmental theory to advance the understanding of leadership. *The Leadership Quarterly*, 17, 634–653. doi:10.1016/j.leaqua.2006.10.006.
- McCrae, R. R., & Costa, P. T. (1989). Reinterpreting the Myers-Briggs Type Indicator from the perspective of the Five-Factor Model of personality. *Journal of Personality*, 57(1), 17–39. doi:10.1111/j.1467-6494.1989.tb00759.x.
- Merron, K.A. (1985). *The relationship between ego development and managerial effectiveness under conditions of high uncertainty* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (<http://search.proquest.com/docview/303377696?accountid=8203>).
- Michaelson, C.B. (1985). *An exploratory study of the health belief model and ego development in predicting health related actions in the aged* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (<http://search.proquest.com/docview/303314064?accountid=8203>).
- Morros, M., Pushkar, D., & Reis, M. (1998). A study of current, former, and new elderly volunteers: A comparison of developmental and trait models of personality. *Journal of Adult Development*, 5(4), 219–230. doi:10.1023/A:1021402325477.
- Myers, I. Briggs, McCauley, M. H., Quenk, N. L., & Hammer, A. L. (2003). *MBTI manual: A guide to the development and use of the Myers-Briggs Type indicator* (3rd ed.). California: CPP Inc.
- Novy, D. M., Blumentritt, T. L., Nelson, D. V., & Gaa, A. (1997). The Washington University Sentence Complete Test: Are the two halves alternate forms? Are the female and male forms comparable? *Journal of Personality Assessment*, 68(3), 616–627. doi:10.1207/s15327752jpa6803_9.
- Novy, D. M., & Francis, D. J. (1992). Psychometric properties of the Washington University Sentence Completion Test. *Educational and Psychological Measurement*, 52, 1029–1039. doi:10.1177/0013164492052004027.
- Pfaffenberger, A. H. (2005). Optimal adult development: An enquiry into the dynamics of growth. *Journal of Humanistic Psychology*, 46(3), 279–301. doi:10.1177/0022167804274359.
- Pittenger, D. J. (2005). Cautionary comments regarding the Myers-Briggs type indicator. *Consulting Psychology Journal: Practice and Research*, 57(3), 210–220. doi:10.1037/1065-9293.57.3.210.
- Redmore, C., & Waldman, K. (1975). Reliability of a sentence completion measure of ego development. *Journal of Personality Assessment*, 39, 236–242. doi:10.1207/s15327752jpa3903_4.
- Richmond, S. L. (2008). *Introduction to type and leadership*. California: CPP Inc.
- Rooke, D. & Torbert, W.R. (1998). Organisational transformations as a function of CEO's developmental stage. *Organization Development Journal*, 16(1), 11–28. Retrieved from <http://www.odinstitute.org>.

- Rooke, D. & Torbert, W.R. (2005). *Seven transformations of Leadership*. Harvard Business Review (April), 1–12. Retrieved from <http://www.newperspectives.com.au/downloads/seven%20transformations%20of%20leadership.pdf>.
- Rushton, S., Morgan, J., & Richard, M. (2007). Teacher's Myers-Briggs personality profiles: Identifying effective teacher personality traits. *Teaching and Teacher Education*, 23(4), 432–441. doi:10.1016/j.tate.2006.12.011.
- Schaubhut, N. A., & Thompson, R. C. (2009). *MBTI type tables international*. California: CPP Inc.
- Steckroth, R., Slocum, J.W. & Sims, H.P. (1980). Organisational roles, cognitive roles, and problem-solving styles. *Journal of Experiential learning and Simulation*, 2, 77–87. Retrieved from <http://sbaweb.wayne.edu/~absel/bkl/.%5Cjels%5C2-2a.pdf>.
- Strang, S. E., & Kuhnert, K. W. (2009). Personality and leadership developmental levels as predictors of leader performance. *The Leadership Quarterly*, 20, 421–433. doi:10.1016/j.leaqua.2009.03.009.
- Torbert, B., Cook-Greuter, S., Fisher, D., Foldy, E., Gauthier, A., Keeley, J., et al. (2004). *Action inquiry: The secret of timely and transforming leadership*. San Francisco: Berrett-Koehler Publishers Inc.
- Vaillant, G.E. & McCullough, L. (1987). The Washington University Sentence Completion Test compared with other measures of adult ego development. *American Journal of Psychiatry*, 144, 1189–1194. Retrieved from <http://ajp.psychiatryonline.org.proxy.library.adelaide.edu.au/article.aspx?Volume=144&page=1189&journalID=13>.
- Vincent, N., Ward, L. & Denson, L. (2013). *Promoting post-conventional consciousness in adults: Australian community leadership programs*. Manuscript in preparation.
- Walck, C. L. (1996). Management and leadership. In A. L. Hammer (Ed.), *MBTI applications: A decade of research on the Myers Briggs Type Indicator* (pp. 55–80). Mountain View, CA: CPP Inc.
- Westenberg, P. M., & Block, J. (1993). Ego development and individual differences in personality. *Journal of Personality and Social Psychology*, 65(4), 792–800. doi:10.1037/0022-3514.65.4.792.
- Wilber, K. (2000). *Integral psychology: Consciousness, spirit, psychology, therapy*. Boston, Massachusetts: Shambala Publications Inc.
- Woodruff, R. G. V., & Clarke, F. M. (1993). Understanding the academic needs of minority students at the University of Hawaii, Manoa. In *Psychological Type and Culture-East and West: A Multicultural Research Symposium* (pp. 199–205).
- Wright, T. M., & Reise, S. P. (1997). Personality and unrestricted sexual behaviour: Correlations of sociosexuality in Caucasian and Asian college students. *Journal of Research in Personality*, 31(2), 166–192. doi:10.1006/jrpe.1997.2177.
- Zilbermann, K.L. (1984). *Ego development and patterns of family interaction* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database (<http://search.proquest.com/docview/303332743?accountid=8203>).